1.2 Sound Waves and Thresholding

Sample Rate

- N equally spaced nodes on $[a,b]$

Sample Rate is $N/(b-a)$

$$SR = \frac{N}{b-a}$$

Thresholding

- $x = [x_1, x_2, \dots x_n]$ $r>0$
- $y = [y_1, y_2, \dots y_n]$

$$y_k = \begin{cases} x_k, & \text{if } |x_k| \geq r \\ 0, & \text{if } |x_k| < r \end{cases}$$

y is the threshold vector for x

obtaining y is thresholding

Percent Reduction, Compression Ratio

$r>0$, $x = [x_1, x_2, \dots, x_n]$

- x has m nonzero entries
- y has k nonzero entries

$$\text{Percent Reduction} = \frac{100(m-k)}{m}$$

$$\text{Compression Ratio} = m/k$$